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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/050,865	01/18/2002	Kouichi Ohtaka	218290US2	9250

22850 7590 03/26/2004

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EXAMINER	
TRA, TUYEN Q	

ART UNIT	PAPER NUMBER
2873	

DATE MAILED: 03/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

8.M-

Office Action Summary	Application No.	Applicant(s)	
	10/050,865	OHTAKA ET AL.	
	Examiner	Art Unit	
	Tuyen Q Tra	2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-107* is/are pending in the application.

4a) Of the above claim(s) *40-44,62,63,71,72 and 103-105* is/are withdrawn from consideration.

5)☒ Claim(s) *1-39, 45-61, 64, 65 and 106* is/are allowed.

6)☐ Claim(s) *66-70,83-102 and 107* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *0304*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Elections/Restriction

Applicant's election with traverse of Group I, in page No. 1103 is acknowledged. This traversal is in on the grounds that Group I and II are neither independent nor distinct and claims 40-44, 62, 63, 71, 72 and 103-105 should be examined together in the same application. This is not found persuasive because Group I and II are patently independent and distinct. Unpatentability of Group I invention would not necessarily imply unpatentability of the Group II invention and otherwise. Group I, claims 1-39, 45-61, 64-70, 73-102, 106 and 107, drawn to MEM device which required a search on class 359, subclass 290. Group II, claims 40-44, 62, 63, 71, 72 and 103-105, drawn to a method of manufacturing using semiconductor which required a search on class 438, subclass 21. These two fields of search are different from each other and therefore, the two groups I and II should not be examined together in the same application.

The requirement is still deemed proper and is therefore made FINAL.

Oath/Declaration

1. The declaration filed **04/11/02** is acceptable.

Drawings

2. The drawings in this application are objected to by the Draftsperson as for the reasons noted on the attached Notice of Draftsperson's Patent Drawing Review, form PTO-948.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 66 is rejected under 35 U.S.C.112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 66 recites "a non-parallel gap is formed between said beam and said recess in a state in which no electrostatic force acts on said beam, said non-parallel gap being generally rectangular between a plane including the upper surface of said substrate and said beam". Since the gap is non-parallel, the gap would not generally be rectangular shape.

Claims 67-70 are rejected because they depend on the above rejected claim.

Claim Rejections - 35 USC § 102

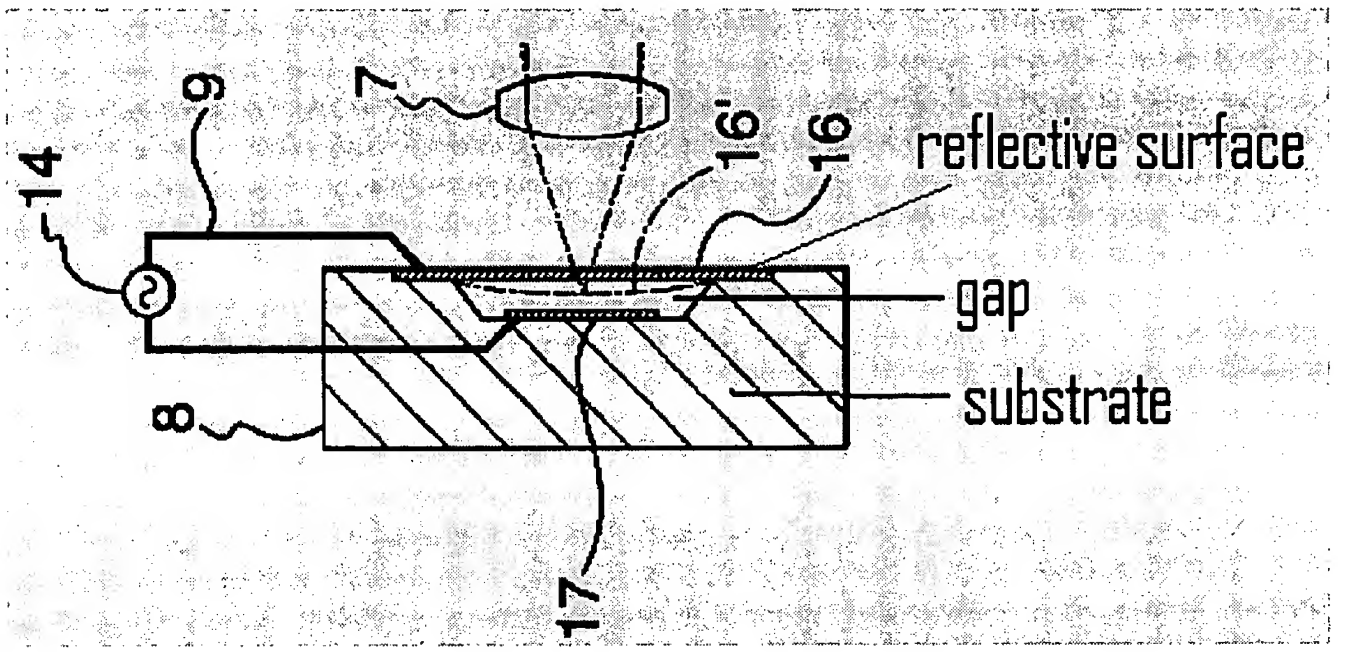
5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Gelbart (U.S. Pat. 6,268,948 B1).

a) With respect to claim 1, Gelbart discloses a micromachined reflective light valve in figure 2 wherein a fixed electrode (item 17), a beam (item 16) which is opposed to said fixed electrode (16) through a gap (as in figure 2) and which has a light reflection surface (not numbered), and a light emission element (13) are formed in a same package; said beam (16) is held to be deformable toward said fixed electrode (17) by an electrostatic force when said beam is driven, light emitted from said light emission element is reflected by said light reflection surface on said beam in different directions between a case in which said beam is driven and a case in which said beam is not driven, and reflection light from said reflection surface is

outputted to an outside of the package when said beam is driven or not driven (see figure below).



b) With respect to claims 74-76, Gelbart discloses wherein the beam is a both-end-fixed beam; wherein the light emission element is an electroluminescence element; wherein the fixed electrode and the beam are formed on a same substrate, and the light emission element is formed on a package upper cover connected to the substrate while being opposed to the beam.

c) With respect to claim 77-79, Gelbart discloses wherein a convex section which converges the light emitted from the light emission element on the beam, is formed on the package upper cover; wherein the fixed electrode, the beam an d the light emission element are formed on a same substrate, and a concave mirror, which converges the light emitted from the light emission element on the beam, is formed on a package upper cover connected to the substrate; wherein the fixed electrode, the beam and the light emission element are formed on a same substrate, and a waveguide path, which guides the light emitted from the light emission element into the gap, is formed in the substrate.

d) With respect to claims 80 and 81, Gelbart discloses wherein a shielding film is formed on a package upper cover, and the light reflected by the light reflection surface on said beam is outputted to an outside of the package through a window provided in the shielding film; wherein the light emission element does not emit light while the beam is deformed.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 83-102 and 107 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gelbart (U.S. Pat. 6,268,948 B1).

a) With respect to claim 82, Gelbart discloses a micromachined reflective light valve in figure 2 a reflection unit which regularly reflects the incident light; a thin film (item 16) with both-end-fixed beam which is formed out of a thin film constituted to be combined with reflection unit, which has both ends fixed into substrate, and which is deformed by an electronic force, said light reflection unit provided on one surface of said thin film (16), both-end-fixed beam; a substrate electrode (item 17) which is opposed to the other side surface of said thin film, both-end-fixed beam, and which applies a driving voltage (item 14); a gap (see figure) which is formed by opposing said substrate electrode (17) to said thin film (16), both-end-fixed beam; a substrate (8) which has said substrate electrode (17) formed in a bottom of said gap, and which holds both ends of said thin film at both-end-fixed beam.

However, Gelbart does not discloses a cover member which is formed to be attached onto said substrate, which includes said thin film, both-end-fixed beam and said gap in a vacuum space, and which is made of a light transmission material.

Since the cover member does not change the characteristic of the output, the use of cover member in the device is consider to be design choice. Therefore, it would have been obvious at the time the invention was made to a person having skill in the art to add cover mean into such optical system for protecting and mounting purposes.

b) With respect to claims 83-88, Gelbart further discloses wherein thin film, both-end beam is made of a monocrystalline silicon thin film; wherein said thin film, both-end beam is made of a polycrystalline silicon thin film; wherein said thin film, both-end beam is made of an amorphous silicon thin film; wherein said thin film, both-end beam is made of a silicon nitride thin film; wherein said thin film, both-end beam is made of a metallic thin film; wherein the gap which is formed by opposing said substrate electrode to said thin film, both-end-fixed beam, is non-parallel.

c) With respect to claims 89-95, Gelbart further discloses wherein a part of or all of said thin film, both-end beam is abutted on a bottom of the gap formed on said substrate when said thin film, both-end beam is deformed by an electronic force which is generated when said substrate electrodes applies the driving voltage; wherein said substrate is made of monocrystalline silicon; wherein said substrate is made of optical glass; wherein said substrate is made of a transparent conductive film; wherein said cover member is made of a glass material; wherein a getter material is formed in the vacuum space formed by said substrate and

said cover member; wherein an attachment section which attaches said substrate to said cover member, consists of a metallic seal layer.

d) With respect to claims 96-102, Gelbart further discloses wherein a difference in coefficient of thermal expansion between said cover member and said substrate is not more than 0 to 30%; wherein said cover member has at least one of a lens, an anti-reflection film and a shielding film formed in a path of the incident light on said reflection unit; wherein said cover member has at least one of a lens, an anti-reflection film and a shielding film formed in a path of reflection light from said reflection unit; wherein said cover member comprises an engraved section formed in an attachment section attached to said substrate; wherein said thin film, both-end-fixed beam formed on said substrate is hexagonal-shaped; wherein a plurality of light modulators are arranged in a form of one of a one-dimensional array and a two-dimensional array; wherein said plurality of light modulators are arranged in a staggered fashion in the form of one of the one-dimensional array and the two-dimensional array.

e) With respect to claim 107, Gelbart further discloses a light switching unit which consists of a light modulator, said light modulator modulating light by changing a reflection direction of incident light, and comprising: a reflection unit which regularly reflects the incident light; a thin film, both-end-fixed beam which is formed out of a thin film constituted to be combined with said reflection unit, which has both ends fixed, and which is deformed by an electronic force, said light reflection unit provided on one surface of said thin film, both-end-fixed beam; a substrate electrode which is opposed to the other side surface of said thin film, both-end-fixed beam, and which applies a driving voltage; a gap which is formed by opposing said substrate electrode to said thin film, both-end-fixed beam; a substrate which has said substrate electrode

formed in a bottom of said gap, and which holds both ends of said thin film, both-end-fixed beam; and a projection screen displaying the image projected by said light modulator of said light switching unit.

However, Gelbart does not discloses a cover member which is formed to be attached onto said substrate, which includes said thin film, both-end-fixed beam and said gap in a vacuum space, and which is made of a light transmission material.

Since the cover member does not change the characteristic of the output, the use of cover member in the device is consider to be design choice. Therefore, it would have been obvious at the time the invention was made to a person having skill in the art to add cover mean into such optical system for protecting and mounting purposes.

Allowable Subject Matter

8. Claims 1-39, 45-61, 64, 65 and 106 are allowed.

The reason for the indication of allowable subject matter is that (claims 1, 45, 46, 47, 48, 64 and 65) a center beam which is formed out of a thin film which has both ends fix and a substrate electrode formed in a concave section; (claim 106) a development unit which develops the latent image formed by said light modulator of said latent image formation unit, and which forms a toner image; and a transfer unit which transfers said toner image formed by said development unit onto a to-be-transferred body disclosed in the claims is not found in the prior art.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a) Drake (US Patent 5,999,303) discloses micromachined mirror using tethered element.

b) Lin et al. (US Patent 5,661,591) discloses optical switch having an analog signal beam for steering light having hexagonal reflective surface.

c) Dhuler et al. (US Patent 6,677,695) discloses MEM electrostatic actuator with a substrate electrodes formed on concave section.

d) Furlani et al. (US Patent 5,793,519) discloses a micromolded integrated ceramic light reflector in Figure 1 with a beam 18, a reflective surface 20 and substrate electrode formed on concave section.

e) Gelbart et al.(US Patent 6,147,789 A) discloses high speed deformable mirror light valve in Fig. 1a and 1b with a beam, refractive surface and substrate electrode.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuyen Tra whose telephone number is (703) 306-5712. The examiner can normally be reached on Monday to Thursday from 8:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps, can be reached on (703) 308-4883. The fax number for this Group is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

tt

March 9, 2004